



SEQUENCE LISTING

<100> Allen, Keith D.  
Matthews, William  
Moore, Mark

<120> TRANSGENIC MICE CONTAINING  
LYMPHOID-SPECIFIC GPCR GENE DISRUPTIONS

<130> R-611

<140> US 09/815,937

<141> 2001-03-22

<150> US 60/191,128

<151> 2000-03-22

<150> US 60/221,485

<151> 2000-07-27

<160> 21

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 4768

<212> DNA

<213> Artificial Sequence

<220>

<223> Phage vector

<400> 1

gttaactacg	tcaggtggca	cttttcgggg	aaatgtgcgc	ggaacccta	tttgtttatt	60
tttctaata	cattcaaata	tgtatccgct	catgagacaa	taaccctgat	aaatgcttca	120
ataaatattga	aaaaggaaga	gtatgagtat	tcaacatttc	cgtgtcgccc	ttattccctt	180
ttttgcggca	ttttgccttc	ctgtttttgc	tcaccagaa	acgctggtga	aagtaaaaga	240
tgctgaagat	cagttgggtg	cacgagtggg	ttacatcgaa	ctggatctca	acagcggtaa	300
gatccttgag	agttttcgcc	ccgaagaacg	ttctccaatg	atgagcactt	ttaaagttct	360
gctatgtggc	gcggtattat	cccgtgttga	cgccgggcaa	gagcaactcg	gtcgccgcat	420
acactattct	cagaatgact	tggttgagta	ctcaccagtc	acagaaaagc	atcttacgga	480
tggcatgaca	gtaagagaat	tatgcagtc	tgccataacc	atgagtgata	acactgcggc	540
caacttactt	ctgacaacga	tcggaggacc	gaaggagcta	accgcttttt	tgcaacaacat	600
gggggatcat	gtaactcgcc	ttgatcggtg	ggaaccggag	ctgaatgaag	ccataccaaa	660
cgacgagcgt	gacaccacga	tgctgttagc	aatggcaaca	acgttgcgca	aactattaac	720
tggcgaacta	cttactctag	cttcccgga	acaattaata	gactggatgg	aggcgggataa	780
agttgcagga	ccacttctgc	gctcgccct	tccggctggc	tggtttattg	ctgataaatc	840
tggagccggt	gagcgtgggt	ctcgcggtat	cattgcagca	ctggggccag	atggtaagcc	900
ctcccgtatc	gtagttatct	acacgacggg	gagtcaggca	actatggatg	aacgaaatag	960
acagatcgct	gagataggtg	cctcactgat	taagcattgg	taactgtcag	accaagttaa	1020
ctcatatata	ctttagattg	atttaccccc	gttgataatc	agaaaagccc	caaaaacagg	1080
aagattgtat	aagcaaatat	ttaaattgta	aacgttaata	ttttgttaa	attcgcgtta	1140
aatttttgtt	aaatcagctc	attttttaac	caataggccg	aaatcgga	aatcccttat	1200
aaatcaaaaag	aatagccga	gatagggttg	agtgttggtc	cagtttgga	caagagtcca	1260
ctattaaaga	acgtggactc	caacgtcaaa	gggcgaaaaa	ccgtctatca	gggcgatggc	1320
ccactacgtg	aaccatcacc	caaatacagt	tttttggggt	cgaggtgccg	taaagcacta	1380
aatcggaacc	ctaaaggag	cccccgattt	agagcttgac	ggggaaagcg	aacgtggcga	1440
gaaaggaagg	gaagaaagcg	aaaggagcgg	gcgctagggc	gctggcaagt	gtagcgggtca	1500
cgctgcgcgt	aaccaccaca	cccgcgcgc	ttaatgcgcc	gctacagggc	gcgtaaaagg	1560

atctaggtga	agatccctttt	tgataatctc	atgacaaaaa	tcccttaacg	tgagtttttcg	1620
ttccactgag	cgtcagaccc	cgtagaaaaag	atcaaaggat	cttcttgaga	tcctttttttt	1680
ctgcgcgtaa	tctgctgctt	gcaaacaaaaa	aaaccaccgc	taccagcggg	ggttttgtttg	1740
ccggatcaag	agctaccaac	tctttttccg	aaggtaactg	gcttcagcag	agcgcagata	1800
ccaaatactg	ttcttctagt	gtagccgtag	ttaggccacc	acttcaagaa	ctctgtagca	1860
ccgcctacat	acctcgctct	gctaatacctg	ttaccagtg	ctgctgccag	tgccgataag	1920
tcgtgtctta	ccgggttgga	ctcaagacga	tagttaccgg	ataaggcgca	gcggtcgggc	1980
tgaacggggg	gttcgtgcac	acagcccagc	ttggagcgaa	cgacctacac	cgaactgaga	2040
tacctacagc	gtgagctatg	agaaagcgcc	acgcttccc	aaggagagaaa	ggcggacagg	2100
tatccggtaa	gcggcagggg	cggacagga	gagcgacga	gggagcttcc	aggggggaaa	2160
gcctgggtatc	tttatagtc	tgtcgggttt	cgccacctct	gacttgagcg	tcgattttttg	2220
tgatgctcgt	cagggggggc	gagcctatgg	aaaaacgcca	gcaacgcggc	cttttttacgg	2280
ttcttgccct	tttgctggcc	ttttgctcac	atgtaatgtg	agttagctca	ctcattaggc	2340
accccaggct	ttacacttta	tgcttccggc	tcgtatgttg	tgtggaattg	tgagcggata	2400
acaatttcac	acaggaaaca	gctatgacca	tgattacgcc	aagctacgta	atacgactca	2460
ctaggcggcc	gcgttttaaac	aatgtgctcc	tctttggctt	gcttccgcgg	gccaaagccag	2520
acaagaacca	gttgacgtca	agcttcccgg	gacgcgtgct	agcggcgcg	cgaattcctg	2580
caggattcga	gggcccctgc	aggtcaattc	taccgggtag	gggagggcgt	tttcccaagg	2640
cagtcctggag	cagtcgcttt	accagccctg	ctggcacttg	gcgctacaca	agtgccctct	2700
ggcctcgcac	acattccaca	tccaccggta	gcgccaaccg	gctccgttct	ttgggtggccc	2760
cttcgcgccca	ccttctactc	ctcccctagt	caggaagtcc	ccccccgccc	cgcagctcgc	2820
gtcgtgcagg	acgtgacaaa	tggaagtagc	acgtctcact	agtctcgtgc	agatggacag	2880
caccgctgag	caatggaagc	gggtaggcct	ttggggcagc	ggccaatagc	agctttgctc	2940
cttcgctttc	tgggctcaga	ggctgggaag	gggtgggtcc	gggggcgggc	tcaggggcgg	3000
gctcaggggc	ggggcgggcg	cgaaggctct	cccaggcccc	ggcattctcg	cacgcttcaa	3060
aagcgcacgt	ctgccgcgct	gttctcctct	tcctcatctc	cgggcctttc	gacctgcagc	3120
caatatggga	tcggccattg	aacaagatgg	attgcacgca	ggttctccgg	ccgcttgggt	3180
ggagaggcta	ttcggctatg	actgggcaca	acagacaatc	ggctgctctg	atgccgccgt	3240
gttcgggctg	tcagcgcagg	ggcgcccggg	tctttttgtc	aagaccgacc	tgtccgggtg	3300
cctgaatgaa	ctgcaggacg	aggcagcgcg	gctatcgtgg	ctggccacga	cgggcgttcc	3360
ttgcgcagct	gtgctcgacg	ttgtcactga	agcgggaagg	gactggctgc	tattgggcga	3420
agtgcggggg	caggatctcc	tgctcatctc	ccttgctcct	gccgagaaa	tatccatcat	3480
ggctgatgca	atgcggcggc	tgcatacgct	tgatccggct	acctgcccat	tcgaccacca	3540
agcgaacat	cgcctcgagc	gagcacgtac	tcggatggaa	gccggtcttg	tcgatcagga	3600
tgatctggac	gaagagcatc	aggggctcgc	gccagccgaa	ctgttcgcca	ggctcaaggc	3660
gcgcctgccc	gacggcgatg	atctcgctcg	gacctatggc	gatgcctgct	tgccgaatat	3720
catggtggaa	aatggccgct	tttctggatt	catcgactgt	ggccggctgg	gtgtggcgga	3780
ccgctatcag	gacatagcgt	tggctaccgg	tgatattgct	gaagagcttg	gcggcgaatg	3840
ggctgaccgc	ttcctcgtgc	tttacggtat	cgccgctccc	gattcgcagc	gcctgcctt	3900
ctatcgctt	cttgacgagt	tcttctgagg	ggatcgatcc	gtcctgtaag	tctgcagaaa	3960
ttgatgatct	attaacaat	aaagatgtcc	actaaaatgg	aagtttttcc	tgctcactct	4020
tgtaagaag	ggtgagaaca	gagtacctac	attttgaatg	gaaggattgg	agctacgggg	4080
gtgggggtgg	ggtgggatta	gataaatgcc	tgctctttac	tgaaggctct	ttactattgc	4140
tttatgataa	tgtttcatag	ttggatatca	taatttaaac	aagcaaaacc	aaattaaggg	4200
ccagctcatt	cctcccactc	atgatctata	gatctataga	tctctcgtgg	gatcattggt	4260
tttctcttga	ttcccacttt	gtgggtctaa	gtactgtggt	ttccaaatgt	gtcagtttca	4320
tagcctgaag	aacgagatca	gcagcctctg	ttccacatac	acttcattct	cagtattggt	4380
ttgccaagtt	ctaattccat	cagaagctga	ctctagatct	ggatccggcc	agctaggccg	4440
tcgacctcga	gtgatcaggt	accaaggtcc	tcgctctgtg	tccgttgagc	tcgacgacac	4500
aggacacgca	aattaattaa	ggccggcccg	taccctctag	tcaaggcctt	aagtgagtcg	4560
tattacggac	tggccgtcgt	tttacaacgt	cgtgactggg	aaaaccctgg	cgttacccaa	4620
cttaatcgcc	ttgcagcaca	tccccctttc	gccagctggc	gtaatagcga	agaggcccg	4680
accgatcgcc	cttcccaaca	gttgccgcagc	ctgaatggcg	aatggcgctt	cgcttggtaa	4740
taaagcccgc	ttcggcgggc	tttttttt				4768

<210> 2

<211> 6355

<212> DNA

<213> Artificial Sequence

<220>

<223> Phage vector

<400> 2

gtttaatagt	aatcaattac	ggggtcatta	gttcatagcc	catatatgga	gttccgcggtt	60
acataactta	cggtaaattg	cccgcctggc	tgaccgcccc	acgacccccg	cccattgacg	120
tcaataatga	cgtatgttcc	catagtaacg	ccaataggga	ctttccaatg	acgtcaatgg	180
gtggagtatt	tacggtaaac	tgcccacttg	gcagtacatc	aagtgtatca	tatgccaagt	240
acgcccccta	ttgacgtcaa	tgacggaaaa	tggccccgct	ggcattaagc	ccagtacatg	300
accttatggg	acttttctac	ttggcagtac	atctacgtat	tagtcacgcg	tattaccatg	360
gtgatgcggt	tttggcagta	catcaatggg	cgtggatagc	ggtttgactc	acggggattt	420
ccaagtctcc	accccatgtg	cgtcaatggg	agtttgtttt	ggcaccaaaa	tcaacgggag	480
tttccaaaat	gtcgtaacaa	ctccgcccc	ttgacgcaaa	tgggcggtag	gcgtgtacgg	540
tgggaggtct	atataagcag	agctggttta	gtgaaccgtc	agatccgcta	gcgctaccgg	600
tcgccaccat	ggtgagcaag	ggcgaggagc	tgttcaccgg	ggtggtgccc	atcctggtcg	660
agctggacgg	cgacgtaaac	ggccacaagt	tcagcgtgtc	cggcgagggc	gagggcgatg	720
ccaccctacg	caagctgacc	ctgaagttca	tctgcaccac	cggcaagctg	cccggtgccct	780
ggcccaccct	cgtgaccacc	ctgacctacg	gcgtgcagtg	cttcagccgc	taccccgacc	840
acatgaagca	gcacgacttc	ttcaagtccg	ccatgcccga	aggctacgtc	caggagcgca	900
ccatcttctt	caaggacgac	ggcaactaca	agaccgcgcg	cgaggtgaag	ttcgaggggc	960
acaccctggg	gaaccgcata	gagctgaagg	gcatcgactt	caaggaggac	ggcaaacatcc	1020
tggggcacaa	gctggagtac	aactacaaca	gccacaacgt	ctatatcatg	gccgacaagc	1080
agaagaacgg	catcaagggtg	aacttcaaga	tccgccacaa	catcgaggac	ggcagcggtc	1140
agctcgccga	ccactaccag	cagaacaccc	ccatcgccga	cggccccgtg	ctgctgcccc	1200
acaaccacta	cctgaggacc	cagtcgcgcc	tgagcaaaga	ccccaacgag	aagcgcgatc	1260
acatggtcct	gctggagttc	gtgaccgccc	ccgggatcac	tctcggcatg	gacgagctgt	1320
acaagtccgg	actcagatcc	accggatcta	gataactgat	cataatcagc	cataccacat	1380
ttgtagaggt	tttacttgct	ttaaaaaacc	tcccacacct	ccccctgaac	ctgaaacata	1440
aaatgaatgc	aattgttggt	gttaacttgt	ttattgcagc	ttataatggt	tacaaaataa	1500
gcaatagatc	cacaaatttc	acaaataaag	ctattttttc	actgcattct	agttgtgggt	1560
tgtccaaact	catcaatgta	tcttaacgcg	aactacgtca	ggtggcactt	ttcggggaaa	1620
tgtgcgcgga	acccctattt	gtttattttt	ctaaatacat	tcaaataatg	atccgctcat	1680
gagacaataa	ccctgataaa	tgcttcaata	atattgaaaa	aggaagagta	tgagtattca	1740
acatttccgt	gtcgccttta	ttcccttttt	tgcggcattt	tgccttcctg	tttttgcctc	1800
cccagaaaac	ctggtgaaa	taaaagatgc	tgaagatcag	ttgggtgcac	gagtgggtta	1860
catcgaactg	gatctcaaca	gcggtaagat	ccttgagagt	tttcgccccg	aagaacgttc	1920
tccaatgatg	agcactttta	aagttctgct	atgtggcgcg	gtattatccc	gtgttgacgc	1980
cgggcaagag	caactcggtc	gccgcataca	ctattctcag	aatgacttgg	ttgagtactc	2040
accagtcaca	gaaaagcatc	ttacggatgg	catgacagta	agagaattat	gcagtgctgc	2100
cataaccatg	agtataaaca	ctgcggccaa	cttacttctg	acaacgatcg	gaggaccgaa	2160
ggagctaacc	gctttttttg	acaacatggg	ggatcatgta	actcgccttg	atcgttggga	2220
accggagctg	aatgaagcca	taccaaacga	cgagcgtgac	accacgatgc	ctgtagcaat	2280
ggcaacaacg	ttgcgcaaac	tattaactgg	cgaactactt	actctagctt	cccggaaca	2340
attaatagac	tggatggagg	cggataaagt	tgcaggacca	cttctgcgct	cggcccttcc	2400
ggctggctgg	tttattgctg	ataaatctgg	agccggtgag	cgtgggtctc	gcggtatcat	2460
tgcagcactg	gggccagatg	gtaagccctc	ccgtatcgta	gttatctaca	cgacggggag	2520
tcaggcaact	atggatgaac	gaaatagaca	gatcgtgag	ataggtgcct	cactgattaa	2580
gcattggtaa	ctgtcagacc	aagtttactc	atatatactt	tagattgatt	taccccggtt	2640
gataatcaga	aaagccccaa	aaacaggaag	attgtataag	caaataatta	aattgtaaac	2700
gttaataaatt	tgtaaaaatt	cgcgttaaat	ttttgttaaa	tcagctcatt	ttttaaccaa	2760
taggccgaaa	tcggcaaaat	cccttataaa	tcaaaagaat	agcccagat	agggttgagt	2820
gttggtccag	tttggaacaa	gagtcacta	ttaaagaacg	tggactccaa	cgtcaaaggg	2880
cgaaaaaacg	tctatcaggg	cgatggcccc	ctacgtgaac	catcacccaa	atcaagtttt	2940
ttggggtcga	ggtgccgtaa	agcactaaat	cggaacccta	aagggagccc	ccgatttaga	3000
gcttgacggg	gaaagcgaac	gtggcgagaa	aggaagggaa	gaaagcgaaa	ggagcggggc	3060
ctagggcgct	ggcaaagtga	gcggtcacgc	tgcgcgtaac	caccacacce	gccgcgctta	3120
atgcgcccgt	acaggcgcg	taaaaggatc	taggtgaaga	tcctttttga	taactctcatg	3180
acaaaaatcc	cttaacgtga	gttttcgttc	cactgagcgt	cagaccccg	agaaaagatc	3240
aaaggatctt	cttgagatcc	tttttttctg	cgcgtaatct	ggtgcttgca	aacaaaaaaa	3300
ccaccgctac	cagcggtggg	ttgtttgccc	gatcaagagc	taccaactct	ttttccgaag	3360
gtaactggct	tcagcagagc	gcagatacca	aatactgttc	ttctagtgtg	gccgtagtta	3420
ggccaccact	tcaagaactc	tgtagcaccg	cctacatacc	tcgctctgct	aatcctgtta	3480

```

ccagtggctg ctgccagtgg cgataagtcg tgtcttaccg ggttggactc aagacgatag 3540
ttaccggata aggcgcagcg gtcgggctga acgggggggtt cgtgcacaca gcccagcttg 3600
gagcgaacga cctacaccga actgagatac ctacagcgtg agctatgaga aagcgccacg 3660
cttcccgaag ggagaaaggg ggacagggtat ccggtaaagcg gcagggtcgg aacaggagag 3720
cgcacgaggg agcttccagg gggaaacgcc tgggtatcttt atagtctctgt cgggtttcgc 3780
cacctctgac ttgagcgtcg atttttgtga tgctcgtcag gggggcggag cctatggaaa 3840
aacgccagca acgcggcctt tttacggttc ctggcctttt gctggccttt tgctcacatg 3900
taatgtgagt tagctcactc attaggcacc ccaggcctta cactttatgc ttccggctcc 3960
tatgttgtgt ggaattgtga gcgataaca atttcacaca ggaaacagct atgaccatga 4020
ttacgccaag ctacgtaata cgactcacta ggcggccgcg tttaaacaat gtgtcctctc 4080
ttggcttgct tccgcggggc aagccagaca agaaccagtt gacgtcaage ttcccgggac 4140
gcgtgctagc ggcgcgccga attcctgcag gattcgaggg cccctgcagg tcaattctac 4200
cgggtagggg aggcgctttt cccaaggcag tctggagcat gcgcttttagc agccccgctg 4260
gcacttggcg ctacacaagt ggccctctggc ctgcacaca ttccacatcc accggtagcg 4320
ccaaccggct ccgttctttg gtggccccctt cgcgccacct tctactctc ccctagttag 4380
gaagtcccc ccgcggcgcg agctcgcgtc gtgcaggacg tgacaaatgg aagtagcacg 4440
tctcactagt ctcgtcgaga tggacagcac cgctgagcaa tggaaagcggg taggcctttg 4500
gggcagcggc caatagcagc tttgtcctt cgctttcttg gctcagaggc tgggaagggg 4560
tgggtccggg ggcgggctca gggggggggt caggggcggg gcgggcgcca aggtcctccc 4620
gagggccggc attctcgcac gcttcaaaag cgcagctctg ccgcgctgtt ctcctcttcc 4680
tcattctcgg gcctttcgcac ctgcagccaa tatgggattcg gccattgaac aagatggatt 4740
gcacgcaggt tctccggcgg cttgggtgga gaggtctattc ggctatgact gggcacaaca 4800
gacaatcggc tgctctgatg ccgcgctgtt ccggtgtca gcgcaggggc gcccggttct 4860
ttttgtcaag accgacctgt ccggtgccct gaataactg caggacgagg cagcgcggct 4920
atcgtggctg gccacgacgg gcgttctctg cgcagctgtg ctgcagcttg tctactgaagc 4980
gggaagggac tggctgctat tgggcgaagt gccggggcag gatctcctgt catctcacct 5040
tgctcctgcc gagaaagtat ccatcatggc tgatgcaatg cggcggctgc atacgcttga 5100
tccggctacc tgcccattcg accaccaagc gaaacatcgc atcgagcagc cagctatcga 5160
gatggaagcc ggtcttgctg atcaggatga tctggacgaa gagcatcagg ggctcgcgcc 5220
agccgaactg ttcgccaggc tcaaggcgcg catgccgac ggcatgatac tcgtcgtgac 5280
ccatggcgat gcctgcttgc cgaatatcat ggtggaaaat ggccgctttt ctggattcat 5340
cgactgtggc cggctgggtg tggcggaccg ctatcaggac atagcgttgg ctacccttga 5400
tattgtgtaa gagcttggcg gcgaatgggc tgaccgcttc ctctgtcttt acggtatcgc 5460
cgctcccgat tcgcagcgca tcgccttcta tcgccttctt gacgagttct tctgagggga 5520
tcgatccgtc ctgtaagtct gcagaaattg atgatctatt aaacaataaa gatgtccact 5580
aaaatggaag tttttcctgt catactttgt taagaagggt gagaacagag tacctacatt 5640
ttgaatgga ggattggagc tacggggggt ggggtggggt gggattagat aaatgcctgc 5700
tctttactga aggtctttta ctattgcttt atgataatgt ttcatagttg gatatacata 5760
tttaaacaag caaaaccaa ttaagggccca gctcattcct cccactcatg atctatagat 5820
ctatagatct ctctgaggat cattgttttt ctcttgattc ccacttttg gttctaagta 5880
ctgtggtttc caaatgtgtc agtttcatag cctgaagaac gagatcagca gcctctgttc 5940
cacatacact tcattctcag tattgttttg ccaagtctta attccatcag aagctgactc 6000
tagatctgga tccggccagc taggcgctcg acctcgagt atcaggtacc aaggtcctcg 6060
ctctgtgtcc gttgagctcg acgacacagg acacgcaa ataataggc cggcccgtac 6120
cctctagtca aggccttaag tgagtcgtat tacggactgg ccgtcgtttt acaacgtcgt 6180
gactgggaaa accctggcgt taccacaact aatcgccttg cagcacatcc ccctttcgc 6240
agctggcgta atagcgaaga ggccgcacc gatcgccctt cccaacagtt gcgcagcctg 6300
aatggcgaat ggcgcttcgc ttggtaataa agcccgcctt ggccgggctt ttttt 6355

```

<210> 3  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Phage vector

<400> 3  
 tgtgtcctc tttggcttgc ttccaa

<210> 4

<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 4  
ttggaagcaa gccaaagagg agcaca

26

<210> 5  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 5  
ctgggttcttg tctggcttgg cccaa

25

<210> 6  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 6  
ttgggcccaag ccagacaaga accag

25

<210> 7  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 7  
ggtcctcgct ctgtgtccgt tgaa

24

<210> 8  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 8  
ttcaacggac acagagcgag gacc

24

<210> 9  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 9  
tttgcgtgtc ctgtgtcgtc gaa 23

<210> 10  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 10  
ttcgacgaca caggacacgc aaa 23

<210> 11  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 11  
aatgtgctcc tctttggctt gcttccgc 28

<210> 12  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 12  
ggaagcaagc caaagaggag cacatt 26

<210> 13  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 13  
aactggttct tgtctggctt ggcccgc 27

<210> 14  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 14  
gggccaagcc agacaagaac cagtt 25

<210> 15  
<211> 28

<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 15  
aaggctcctcg ctctgtgtcc gttgagct 28

<210> 16  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 16  
caacggacac agagcgagga cctt 24

<210> 17  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 17  
aatttgctg tctgtgtcg tcgagct 27

<210> 18  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Phage vector

<400> 18  
cgacgacaca ggacacgcaà att 23

<210> 19  
<211> 2072  
<212> DNA  
<213> Mus musculus

<400> 19  
ggacatggac tgctatctgc gtcgcctcaa acaggagctg atgtccatga aggaggtggg 60  
ggatggcttg caggatcaga tgaactgcat gatgggcgca gactgggcta gctggagaga 120  
gacaagaacc aaaagcacag ctttctgtg tgatttctac agccccaga gcaccatgga 180  
cccagggaaa cccaggaana acgtgctggt ggtggctctc cttgtcattt tccaggtgtg 240  
cttctgccaa gatgaggtca ccgatgacta catcggcgag aataccacgg tggactacac 300  
cctgtacgag tcggtgtgct tcaagaagga tgtgcggaac tttaaggcct ggttctctgcc 360  
tctcatgtat tctgtcatct gcttcgtggg cctgctcggc aacgggctgg tgatactgac 420  
gtacatctat ttcaagaggc tcaagaccat gacggatacc tacctgctca acctggccgt 480  
ggcagacatc cttttcctcc taattcttcc cttctgggcc tacagcgaag ccaagtctctg 540  
gatctttggc gtctacctgt gtaagggcat ctttggcatc tataagttaa gcttcttcag 600  
cgggatgctg ctgctcctat gcatcagcat tgaccgctac gtagccatcg tccaggccgt 660  
gtcgcgtcat cgccaccgag cccgcgtgct tctcatcagc aagctgtcct gtgtgggcat 720  
ctggatgctg gccctcttcc tctccatccc ggagctgctc tacagcggcc tccagaagaa 780

```

cagcggcgag gacacgctga gatgctcact ggtcagtgcc caagtggagg ccttgatcac 840
catccaagtg gcccagatgg tttttgggtt cctagtgcct atgctggcta tgagtctctg 900
ctacctcatt atcatccgta ccttgctcca ggcacgcaac tttgagcgga acaaggccat 960
caaggtgatac attgccgtgg tggtagtctt catagtcttc cagctgccct acaatggggt 1020
ggtcctgggt cagacgggtg ccaacttcaa catcaccaat agcagctgcg aaaccagcaa 1080
gcagctcaac attgcctatg acgtcaccta cagcctggcc tccgtccgct gctgcgtcaa 1140
ccctttcttg tatgccttca tcggcgctcaa gttccgcagc gacctcttca agctcttcaa 1200
ggacttgggc tgcctcagcc aggaacgggt cccggcactgg tcttctctgc ggcatgtacg 1260
gaacgcgtcg gtgagcatgg aggcggagac caccacaacc ttctccccgt aggggggtcc 1320
cctgcccga ctacaaggac ctctcccagg agccttaatg tgggtgcacac atgcacagac 1380
tctccatcca ccgaattgct gctgagggaa gagcaattct ggccagtcag gttgacatga 1440
ggacctaa aactgcttaa ccccatccca cttataacta cctcaaccaa agctgtaaaa 1500
gatatggctg agaagttaac actcaagcca agacagctat ccccaaaacg acagccaaaa 1560
gtgaaagtga gaggctccac actttccgga gtgagggatg tggggccagt gaacaccctg 1620
gttgagtagt cttcggagge ctctgaatga acctgcttct agcttagaga gatgtcccgg 1680
agattcaaga cagagcttat ctccacactt agcaagcaag caagagatga cagtctctct 1740
aaatgctccc acagagcacc cctgcccctc ccttctgctt ctccaccgcc tttcttgagg 1800
tccaggccac accatgacgc tgaggcagtc ccagctgggg ctctggatgg caatgacaag 1860
tagttgggtc tctatgatgg gaataaaaaa gtaggggaaa ggtgacagga aggagagaag 1920
gtgaccctgc tggctgacag aggccagcaa gctacttctt tgttctctgt cagccagcca 1980
ctgatacctt tcctcatgtt ctgcttttga ttcatatatc ttttatgaag aaacaaataa 2040
aaaaaaaatt ttccctcgag gaaacaactt gg 2072

```

```

<210> 20
<211> 200
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Targeting vector

```

```

<400> 20
gatgactaca tcggcgagaa taccacgggtg gactacaccc tgtacgagtc ggtgtgcttc 60
aagaaggatg tgcggaactt taaggcctgg ttcctgcctc tcatgtattc tgtcatctgc 120
ttcgtggggc tgctcgga cgggctgggtg atactgacgt acatctattt caagaggctc 180
aagaccatga cggataccta 200

```

```

<210> 21
<211> 199
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Targeting vector

```

```

<400> 21
aaccagcaag cagctcaaca ttgccatgac gtcacctaca gcctggcctc cgtccgctgc 60
tgctcaacc ctttcttgta tgccctcatc ggcgtcaagt tccgcagcga cctcttcaag 120
ctcttcaagg acttgggctg tctcagccag gaacggctcc ggcactggtc ttcctgccgg 180
catgtacgga acgcgtcgg 199

```